

REMARKS:

Applicants object to the Examiner's overly broad reading of the teachings of the references. The USB connects a host computer with devices. A communication path between the host computer and the USB may be called a "pipe." The USB has endpoints connected to the devices. The present invention is drawn to reconfiguration of connections between the endpoints and the devices, which takes place outside the USB. In other words, in the present invention, connections between the SUB endpoints and the devices are selectively changed.

To effect a selective change in connection between the USB endpoints and the device, claim 1 has the limitation, "a controller which selects one or more endpoints and connects said one or more end points with said logical device." (see claim 1 produced below).

1. An electronic device comprising:
 - a device section including a plurality of logical devices;
 - a USB transmitter-receiver having one or more endpoints for sending and receiving to/from a host computer information via a universal serial bus, said one or more endpoints being shared by said plurality of logical devices; and
 - a controller which, on the basis of information from said host computer designating a desired logical device in said device section, selects one or more endpoints required for sending and receiving information between said logical device and said host computer from the endpoints within said USB transmitter-receiver and connects said one or more endpoints with said logical device.

The claims 9 and 18 have similar limitations as shown below:

9. A mobile device that provides multiple functionalities for a host computer through USB communication, comprising:
 - a plurality of logical devices that provide different functionalities and are all recognizable under one USB address by the host computer;

a USB that comprises multiple endpoints which collectively provide multiple data transfer functionalities and at least some of which are reconfigurable to provide different data communication capabilities for the logical devices;

a device selector that, in response to a service request from the host computer, dynamically connects one or more endpoints to a logical device adapted to provide the requested service; and

an endpoint configurator that reconfigures, if necessary, some of the one or more endpoints to effect data communication between the host computer and the selected logical device.

18. A method for providing different functionalities to a host computer through a USB, comprising the steps of:

providing a mobile device with a plurality of logical devices that provide different functionalities and are all recognizable under one USB address by the host computer, wherein the mobile device is connected to the host computer;

notifying the host computer of configurations of the logical devices through a USB that comprises multiple endpoints which collectively provide multiple data transfer functionalities and at least some of which are reconfigurable to provide different data communication capabilities for the logical devices;

receiving a service request from the host computer through the USB;
dynamically connecting one or more endpoints to a logical device adapted to provide the request service; and

reconfiguring, if necessary, some of the one or more endpoints to effect data communication between the host computer and the selected logical device.

On other hand, the cited references are all drawn to reconfiguration or remapping of connections between the pipe and the endpoints, which takes place within the USB, not the outside of the USB. In the cited references, the endpoints of the USB are statically connected to the outside devices.

In Siddappa cited as a 102(b) reference, the specification recites,

“To enhance the functional versatility, a USB device can support multiple logical channels of communication with the host. In the parlance of the USB specification, such logical channels are referred to as “pipes.” Each pipe provides a unidirectional flow of data between a software client resident in the host and an endpoint defined within the device. Functions implemented within the device receive data from the host at their respective endpoint(s), and transmit data to the host by writing to their respective endpoints(s).” (lines 27-36, page 1). (the underlines added).

Also, the specification recites,

“the device software 18 provides the functional capabilities of the device. Each functionality communicates with its associated endpoint E1 – En, receiving or transmitting data via the FIFOs corresponding to those endpoints.” (line 37, page 2 – line 3, page 3). (the underline added).

The way Applicants read the underlined portions in the specification of Siddappa is that the connections between the outside devices and the endpoints are fixed and cannot be changed. If the Examiner disagrees with Applicants’ reading of Siddappa, Applicants respectfully request that the Examiner point the portion in Siddappa that indicates that the connections between the USB endpoints and the outside devices are selectively changed.

Siddappa goes on to discuss the prior art and indicates that the conventional USB has a FIFO for each endpoint. Siddappa proposes a USB which has only one FIFO. Since the USB has only one FIFO, which connects the pipes and the endpoints, the USB needs reconnection between the pipes and the FIFO and reconnection between the FIFO and the endpoints so that the one FIFO can serve all the pipes and all the endpoints.

The Examiner cites Universal Serial Bus Specification Revision 1.0 under 35 U.S.C. 102(b). In the Office Action, the Examiner points to Figure 5-8 on page 45 of the specification. Please note that in the figure, the logical devices are fixedly connected to the associated endpoints. Again, if the Examiner disagrees with Applicants, Applicants

respectfully request that the Examiner point the portion in the specification that indicates that the connections between the USB endpoints and the outside devices are selectively changed.

Brief et al is also drawn to reconfiguration of connection between the pipes and the endpoints and silent about reconfiguration of connection between the endpoints and the devices. In fact, in Brief, the connections between the endpoints and the outside devices are fixed. The specification of Brief recites,

“Some time after the initialization process completes, the allocation of pipes to particular endpoints of a device is fixed.” (lines 43-45, col. 2)


The “particular endpoints of a device” refer to USB endpoints. The specification also recites,

“By way of example, a multi-function device may include a fax and a digital telephone function. During initialization, the multi-function device is assigned a unique functional address and the fax and digital telephone functions are each associated with distinct endpoint numbers. Out pipes for transmitting data to each function are likewise allocated during initialization. One out pipe is associated with an endpoint number for the fax function, and one out pipe is associated with an endpoint number for the printer function.” (lines 27-36, col. 3). (the underline added).

Brief discusses an allocation between the pipes and the endpoints. But it is silent about an allocation of connections between the endpoints and the devices. In fact, Brief does not distinguish between the endpoints and the devices because they are fixedly connected.

Thus, none of the references discloses or teaches a selective change or allocation between the endpoints and the devices. Since none of the cited references discloses or teaches a selective change or allocation between the endpoints and the devices, claims 1, 9 and 18, and their dependent claims should be allowable over the cited references.

Respectfully submitted,



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